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ABSTRACT

This paper describes a partnership developed between the Baltimore County Public Schools and Johns Hopkins University. The purpose of the partnership was to train teachers to become school-based leaders in technology through a 36-credit graduate program in Technology for Educators. The paper is divided into the following sections: (1) the partner institutions; (2) the development of a collaborative cohort; (3) competencies; (4) key elements of the partnership, including selection of candidates, role of principals and school improvement teams, and applied projects; (4) implementation strategies that worked; and (5) challenges to anticipate. A table lists core competencies for school-based technology leadership in three areas: technology planning, instructional leadership, and change and program evaluation. (AEF)

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Preparing Teachers for School-based Technology Leadership

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Futurists predict that for today's students to succeed in the next century they must not only be technologically literate, they must also know how to think and use technology as a partner in their work. School district central office staff can no longer keep up with the demands of individual schools for technology planning, staff training and daily technical support.

Over the past decade, the number of computers and related classroom technologies has increased substantially. In 1987, there was one computer for every 37 students; now the ratio is one to seven (Technology Counts, 1997). While more than half of the computers are located outside of computer laboratories, only 15% of the nation's teachers have had at least nine hours of technology training (Technology Counts 1997). What can school districts do to prepare teachers to take advantage of the new instructional tools?

This paper describes a partnership developed between the Baltimore County Public Schools and Johns Hopkins University. The purpose of the partnership is to train teachers to become school-based leaders in technology through a 36-credit graduate program in Technology for Educators. The paper is divided into three sections: (a) the setting and the institutions; (b) the development and implementation of the Masters degree program; and (c) the emerging impact of the training effort.

Partner Institutions

The Baltimore County Public School district is the nation's twenty-fifth largest, comprised of 159 schools spread over an area of 610 square miles. Some of the schools are located in urban settings, others in the suburbs, and still others are rural schools. The district's Department of Information Technology works with each of the principals to provide technical and curricular support to the instructional program in each of these diverse settings. The Department has established a system of Technology Liaisons, including a representative from each school, charged with providing local support for computer-related instruction.

Technology Liaisons were established for two reasons. First, local ownership of the technology is considered an effective link with the district's site-based approach of governance. Each school develops and administers a school improvement plan that incorporates technology into the instructional program. In addition, the district office does not have sufficient personnel to maintain a constant presence in each school. The Technology Liaison helps fill the gap. The Technology Liaison approach is limited by the local representative's technical capabilities and by the ability to encourage and support school efforts to effectively plan and use instructional technologies.

To help address these issues, Baltimore County engaged Johns Hopkins University as a partner in developing the local liaison into a true site-based leader in instructional technology. Located in nearby Baltimore City, the University was prepared to work with the school district to develop a cadre of technology leaders for the schools. The task was consistent with the mission of the University's School of Continuing Studies, Division of Education which calls for graduate programs that prepare educational personnel to become leaders and change agents, and the development of partnerships with educational institutions. The University already had a well-established graduate program in Technology for Educators administered through its Center for Technology in Education and the existing program provided hands-on course work in technology as well as project-based instruction on curriculum integration.

Development of a Collaborative Cohort

Baltimore County Public School and Johns Hopkins University began work on a new master's program in 1995. The goals of the program centered on three areas: (a) technical competence; (b) school-based leadership; and (c) the change process. The three areas directly addressed the expressed needs of district schools. Each school required on-site technical support and was charged with incorporat-

ing technology into the curriculum. Faculty needed staff development and support to effect changes in curriculum and teaching methods. The district and the University jointly determined competencies in these areas.

Competencies

Instructional technology administrators from the school system and faculty from the University collaborated to establish the competencies for the cohort students participating in this Master of Science in Education Technology for educators program. Selected competencies were based on guidelines for graduate programs developed by the International Society for Technology in Education (ISTE, 1991) and the Interstate New Teacher Assessment and Support Consortium (INTASC). Competencies were designed to prepare teachers to: (a) plan technology use and provide technology resources; (b) apply research-based principles as effective instructional leaders and master practitioners; and (c) be change agents for promoting school improvement and evaluating school change. Specific competencies are shown in Table 1.

Key Elements of the Partnership

Selection of Candidates

Each candidate selected for this program had to meet the regular requirements of admission into a Johns Hopkins University School of Continuing Studies graduate program, and also had to be identified and recommended by the district and school administration as a master teacher with leadership potential. Further requirements included a minimum of three years experience at the elementary level, advanced computer literacy and demonstrated competence in instruction and classroom management.

Role of Principals and School Improvement Teams

Principals with cohort members who worked in their schools agreed to participate in two seminars per year on leadership and technology. The principals and school improvement teams also agreed to support the implementation of participating teachers' projects within the schools. The seminars served as a vehicle for updating the school and district administrators on the scope and direction of the course content, as well as a forum for presenting projects that incorporated current research about effective technology applications for instruction in schools. Classes and seminars were held in local school facilities, contributing to the authenticity and relevance of course content because students used resources available in their schools to apply what they were learning in the program.

Applied Projects

Cohort members developed projects in each of their graduate courses. Projects were related to the program

Table 1.
Core competencies for School-based Technology Leadership-Master of Science in Education Technology for Educators Program

Technology Planning	Instructional Leadership	Change and Program Evaluation
Apply computers and related technologies to facilitate active learning and effective instruction.	Explore, evaluate, and use technology-based instructional strategies, including applications, educational software and documentation.	Demonstrate knowledge of equity, ethical, legal, and human issues of computing and technology as they relate to society and model appropriate behaviors.
Apply research, the principles of effective instruction, and appropriate assessment practices to the use of computers and related technologies.	Demonstrate knowledge of technology applications for problem solving, data collection, information management, communications, presentations, and decision making.	Identify resources for staying current in applications of computing and related technologies in education.
Plan school-wide technology configurations.	Design and develop effective instructional activities that integrate technology in order to meet the learning needs of diverse student populations, including students with disabilities.	Facilitate the design and implementation of educational computing across the curriculum in concert with individual school improvement plans.
Evaluate, select, and integrate technology into curriculum and instruction across disciplines for all students, including those with disabilities.	Demonstrate knowledge of uses of multimedia, hypermedia, and telecommunications technology to support effective instruction.	Implement staff development programs at school and district levels.

competency areas, including: (a) development of school-wide technology plans; (b) school and district level staff development programs; and (c) evaluation of technology implementation in relation to goals listed in school improvement plans. Components of the projects included applied research, implementation strategies, and evaluation of student learning.

For example, cohort members developed comprehensive plans for opening newly networked buildings and/or wiring plans for distributed networks in renovation projects. The students' plans added the dimensions of examining the purposes and potential outcomes of increasing access to technology and how it would improve the school's instructional programs. The courses in the graduate program provided students with the expertise necessary to take a leadership role in planning for technology, that was critical to the accomplishment of school improvement goals.

Other student projects focused on the integration of technology into the curriculum. In these projects, students demonstrated a thorough understanding of the potential of technology to enhance the curriculum and to improve learning. Students mastered multimedia tools and the Internet, included these applications in instructional units and, trained colleagues in their schools to use these tools. Projects became the basis for school-wide, and often district-wide, staff development workshops.

Building-level administrators benefited from the expertise that cohort members developed as a result of the program. Cohort members reached a level of competence that allowed them to take ownership of technology innovations in their schools, and provide support for implementation of their innovations. The district plan calls for a cadre of trained teachers to serve as liaisons assigned at the building level to facilitate the infusion of technology into schools. The students in this program are prepared to serve in this capacity. They are now armed with skills to make a difference in their schools.

Implementation Strategies that Worked

.The cohort program variations were designed to focus on school-wide technology leadership and to develop competencies that prepare teachers to serve as local experts and change agents for their schools and school districts. Several factors led to the students' development as local experts and change agents. One was the location of classes. Most of the classes met in a local school facility. Field trips to other sites within the district were incorporated into the instruction. This required each of the graduate courses to use the resident hardware, software and network configuration available in district schools. Using the local schools also provided cohort members an opportunity to evaluate district-wide issues, such as: age and condition of building; feasibility for wiring, networking and upgrading equipment; expertise of administrators and staff; resources for procurement of wiring, hardware equipment, software and training; and parental expectations and support for technology in schools. District and building level support were key, not only for accessing the district facilities for course instruction, but also for providing information regarding plans for infusing technology in schools throughout the district. The district-level leadership for technology plans to use graduates of this program for key positions in Technology Literacy Challenge funds and Goals 2000 grants.

Personal characteristics of the cohort members was also a second factor that contributed to their ability to become experts and change agents in their schools. Demonstration of leadership potential was a criterion for an invitation to apply. Therefore, the students were highly motivated to become leaders, having already been identified by their principals as showing leadership qualities. Students were also intrinsically motivated and curious about the benefits of technology. They had the urge to be creative and the desire to be innovative—characteristics critical to technology leadership in schools. As evidence of the success of the program in preparing technology leaders, two students in the program have been recognized as Baltimore County Computer Educators of the Year by the Maryland Instructional Computer Coordinators Association for their site-based technology leadership.

Diverse thinking and leadership qualities of the students were the third and fourth factors in the success of the program. Although cohort members were primarily elementary teachers from a single school district, they used diverse applications of the theories and research presented in courses in their teaching environments. Courses were developed and taught by University faculty and adjunct instructors with experiences from districts outside of Baltimore County. Assignments were designed to develop new skills and understanding for individual students and to facilitate the application of those skills and knowledge in their own teaching situations. Cohort members exercised their leadership skills at the building level to obtain resources and the principals' approval to complete the project assignments.

Challenges to Anticipate

Instituting a graduate program in partnership with a local school system brings a set of challenges to both parties. The university standards for admissions and tuition rates must be factored into the partnership negotiations. The university must be willing to customize a program and commit resources to deliver the instruction, as well as to establish and maintain collaboration with the district and building level administration. The school system must commit to providing the facilities and technology resources for the program. Both institutions expose themselves to the political implications of a partnership, as well as to internal political ramifications that may arise from the process of

selecting students, locating sites for classes and providing technology resources.

Time is another challenge for a cohort of students in any graduate program. To complete the program according to the schedule, students were required to complete 12 credits per year for three consecutive years. This is a rigorous pace, in terms of both time and money, compared to the typical master's student who is allowed, and often needs, five years to complete the 36 credit requirement. Classes were held after school when teachers are tired and in the summer when their families and colleagues are on vacation. The new knowledge the students acquired brought new demands on their time and responsibilities for technology advancements within their schools that competed with the program for the students' time and attention.

There is often mobility in assignments within school systems. Mobility presents challenges in that teachers get assigned to schools where they have neither the commitment of the principal nor the technology resources for carrying out their technology implementation plans. They may be required to work with novice staff to develop grade level team instruction that does not include the use of technology. The new school may have other priorities for school improvement initiatives.

These challenges routinely face districts and universities that initiate special programs for cohorts of students from a single district. A customized graduate program can address these issues and provide support to the students and to the partnering district. The problem-based learning format then becomes a solution to the challenges presented in the authentic context of working within a school district.

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